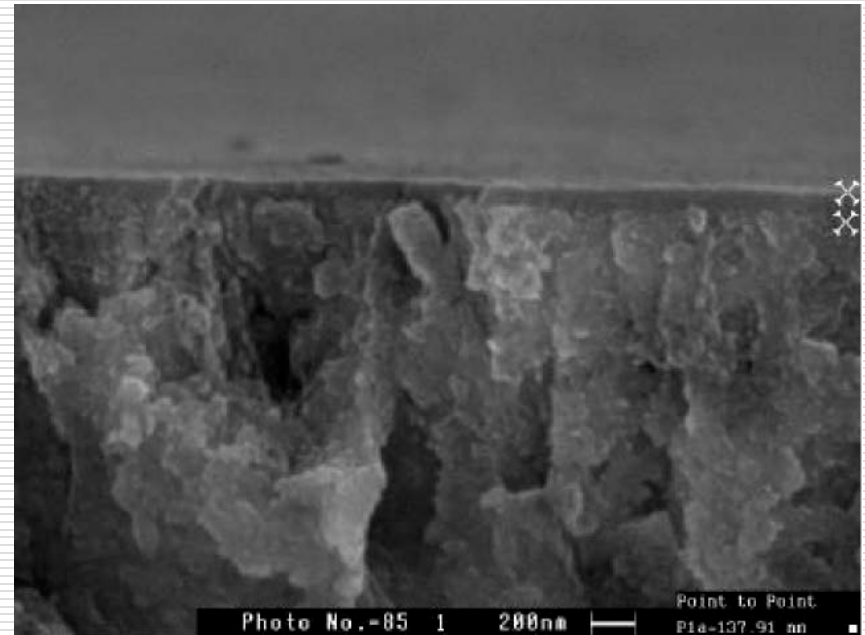




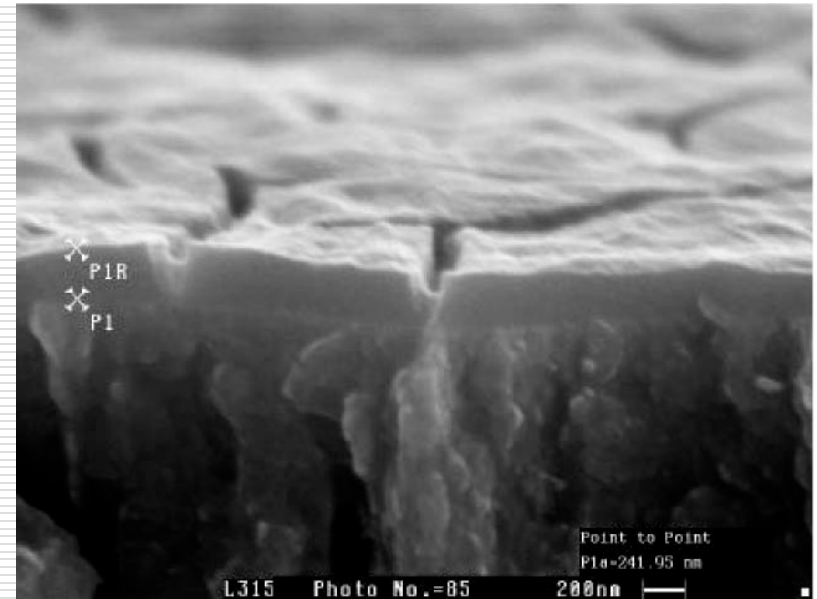
First & Second Generation Trivalent Passivates

- 2nd Generation adds “more of same” (chromium, temperature, fluoride) to 1st to increase NSST
 - Thickness: ~ 100 nm
 - Temperature: Ambient
 - Appearance: Clear/Blue
 - Corrosion Protection:
24-48 HRS to WR
 - Need topcoat (silicate, polymer, wax, etc.) to meet automotive requirements
-



3rd Generation – “Thick Film” Passivates

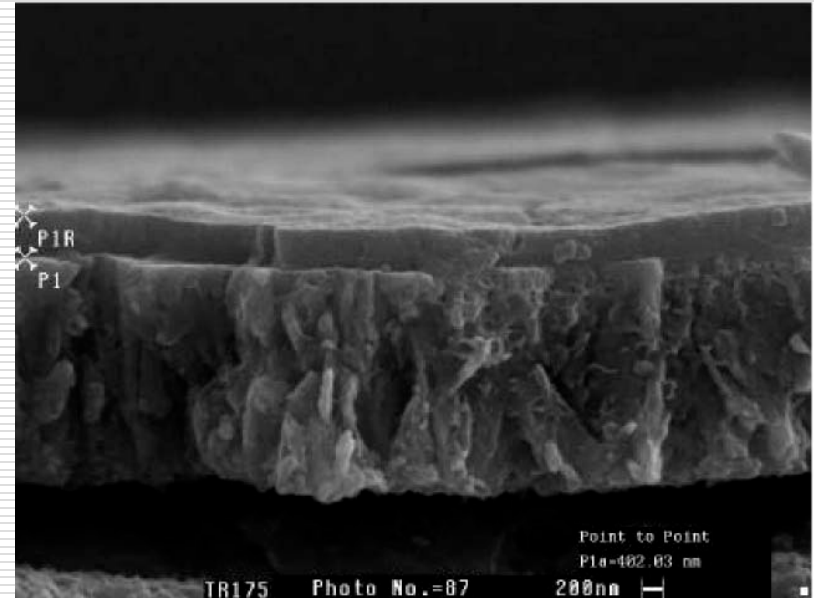
- Thickness: 200-250 nm
- Temperature: 60°C
- Base: Organic Acid
- CrIII: 10 g/L
- Corrosion Protection:
~168 HRS to WR
- Appearance:
Iridescent Green/Yellow
- Short Bath Life
- Stability Issues
- Potential for WT Difficulties



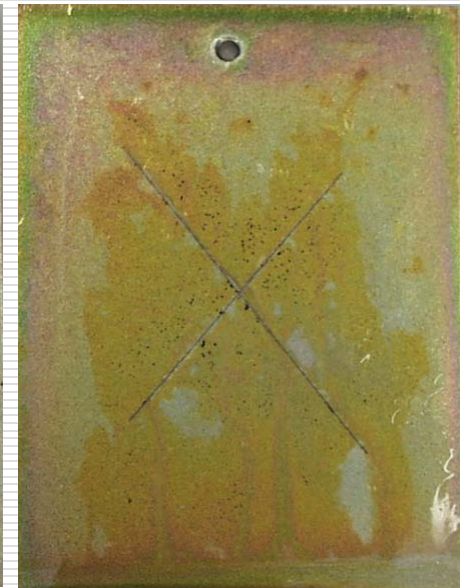
4th Generation Passivate – TR-175



- Thickness: 400-500 nm
- Temperature: Ambient
- Base: Nano-Particle
- Appearance: Clear/Iridescent
- Corrosion Protection:
 >250 HRS to WR
- **Self-Healing**
- Totally Inorganic
 No WT or Stability Issues
- Excellent Heat Resistance
- Consistent NSST Results



Progression of CrIII Technology



1st & 2nd Gen.

3rd Gen.

4th Gen. TR-175

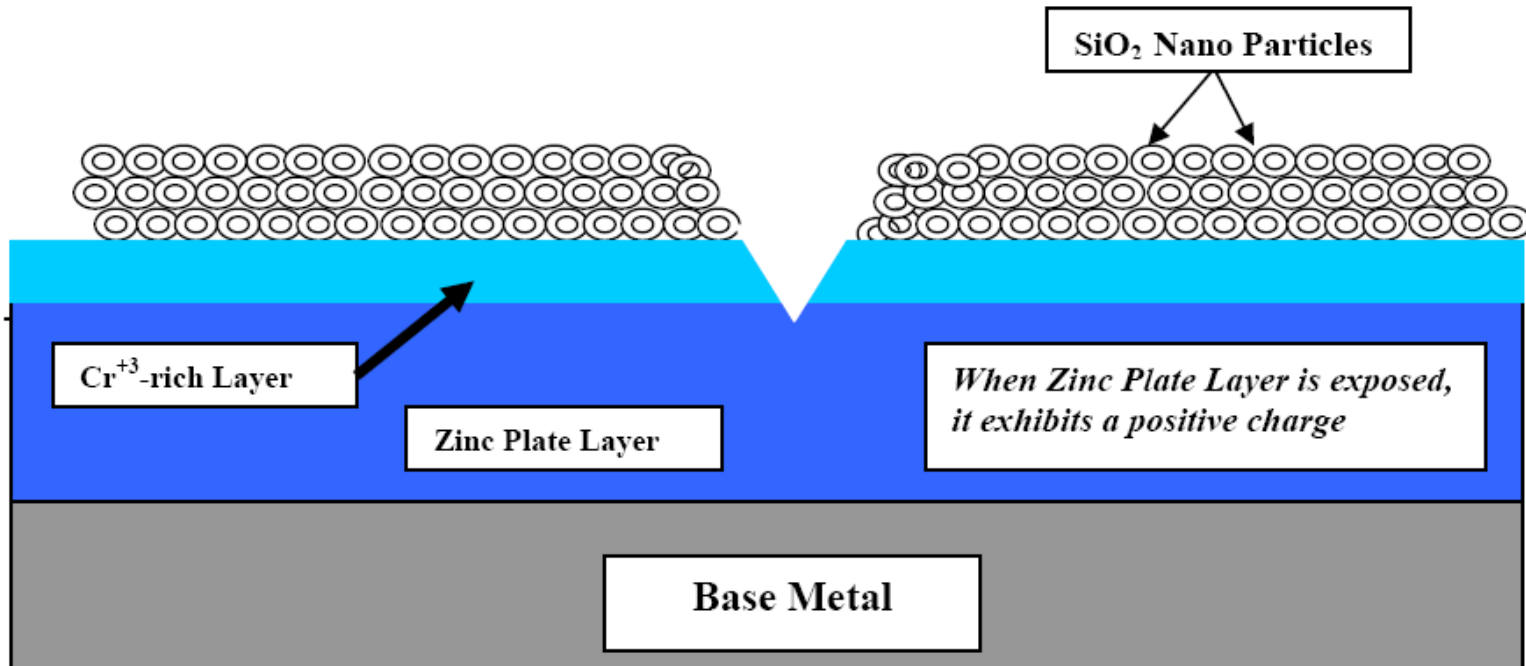
CrVI

Self-Healing Mechanism

4th Generation Passivate – TR 175



Appearance Immediately After Passivate Film is Compromised:

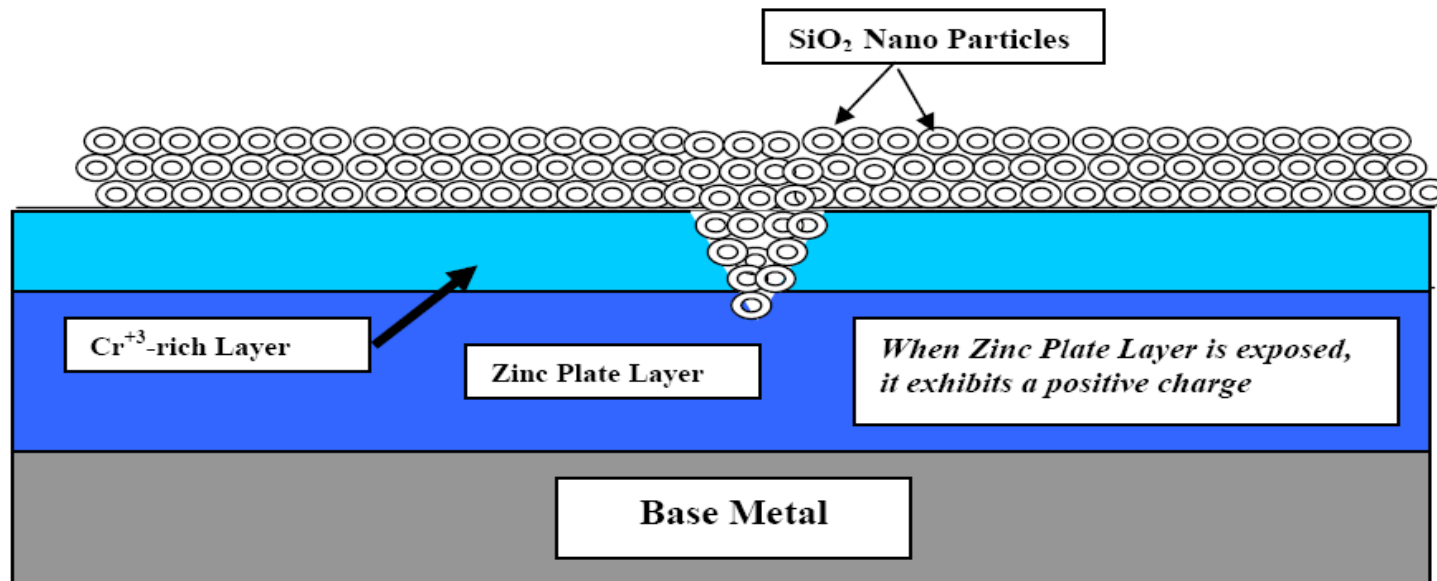


Self-Healing Mechanism

4th Generation Passivate – TR 175



Appearance After Passivate Film “Heals”:



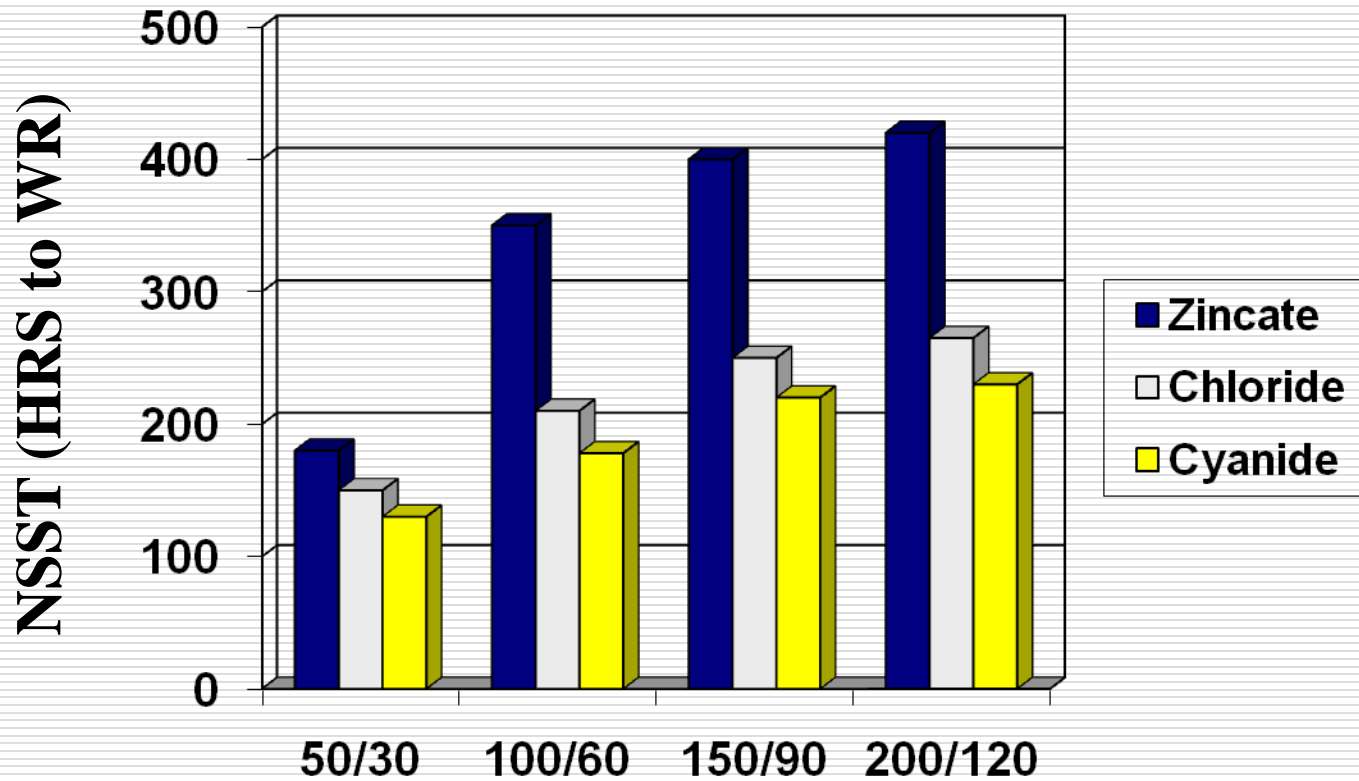
Particles from the Special Protective Layer are negatively charged, and are attracted to the positively charged exposed Zinc. When they migrate to the scratch, they fill it in, thus automatically “healing” the defect.



TR-175



SST - Zinc Electrolyte & Concentration



TR-175AB (ml/L)